

$$\textcircled{1} \lim_{x \rightarrow -3} \frac{-x^2 - 2x + 3}{x^3 + 3x^2} = \lim_{x \rightarrow -3} \frac{-(x+3)(x-1)}{x^2(x+3)} = \frac{4}{9}$$

$$\textcircled{2} \lim_{x \rightarrow 5} \frac{3x^2 - 17x + 10}{3x^2 - 16x + 5} = \lim_{x \rightarrow 5} \frac{3(x - \frac{2}{3})(x-5)}{3(x - \frac{1}{3})(x-5)} =$$

$$= \lim_{x \rightarrow 5} \frac{3x-2}{3x-1} = \frac{13}{14}$$

$$\textcircled{3} \lim_{x \rightarrow -2} \frac{16 - x^2}{x^3 + 6x^2 + 12x + 8} = \infty \quad (\text{мысли нет деления})$$

$$[\frac{\neq}{0} = \infty]$$

$$\textcircled{4} \lim_{x \rightarrow 2} \frac{4x^2 - 5x - 6}{x^3 - 5x + 2} = [\frac{0}{0}] = \lim_{x \rightarrow 2} \frac{4(x + \frac{3}{4})(x-2)}{(x-2)(x^2 + 2x - 1)} =$$

$$= \lim_{x \rightarrow 2} \frac{4x+3}{x^2+2x-1} = \frac{11}{7}$$

$$\textcircled{5} \lim_{x \rightarrow -1} \frac{x^4 + 2x + 1}{x^4 + 4x^2 - 5} = [\frac{0}{0}] = \lim_{x \rightarrow -1} \frac{(x+1)(x^3 - x^2 + x + 1)}{(x+1)(x^3 - x^2 + 5x - 5)} =$$

$$= \frac{-2}{-12} = \frac{1}{6}$$

$$\textcircled{6} \lim_{x \rightarrow 3} \frac{x^4 - 81}{3x^3 - 7x^2 - 6x} = [\frac{0}{0}] = \lim_{x \rightarrow 3} \frac{(x^2 - 9)(x^2 + 9)}{x(3x^2 - 7x - 6)} =$$

$$= \lim_{x \rightarrow 3} \frac{(x-3)(x+3)(x^2+9)}{x \cdot 3(x + \frac{2}{3})(x-3)} = \frac{6 \cdot 18^6}{3 \cdot 11 \cdot 11} = \frac{36}{11}$$

$$\textcircled{7} \lim_{x \rightarrow 3} \left(\frac{4}{x^2 - 2x - 3} - \frac{1}{x-3} \right) = [\infty - \infty] =$$

$$= \lim_{x \rightarrow 3} \left(\frac{4}{(x-3)(x+1)} - \frac{1}{x-3} \right) = \lim_{x \rightarrow 3} \left(\frac{4 - (x+1)}{(x-3)(x+1)} \right) =$$